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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,770	05/09/2007	Yoshihiro Miyake	062744	4655

38834 7590 06/08/2009

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EXAMINER	
STEVENS, THOMAS H	

ART UNIT	PAPER NUMBER
2121	

MAIL DATE	DELIVERY MODE
06/08/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,770	MIYAKE, YOSHIHIRO	
	Examiner	Art Unit	
	THOMAS H. STEVENS	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6,7,9,10 and 12-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6,7,9,10, and 12-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1,3,4,6,7,9,10, and 12-14 were examined.

2. Claims 2,5,8, and 11 were cancelled.

Section I: Non-Final Section

Claim Interpretation

3. Office personnel are to give claims their **"broadest reasonable interpretation"** in light of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater,* 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551(CCPA 1969). See *also *In re Zletz,* 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow") .... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed .... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be

removed, as much as possible, during the administrative process. The Office establishes equivalence between figure 1 of the invention and figure 3 of Miyake, respectively: System=Controller; FBS module=Internal Module; NLS module=Oscillator System; Relation value= Observation/action (mutual-entrainment); Controlling Object: Environment.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1,3,4,6,7,9,10,12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyake et al., titled, “Mutual Adaptation in Human-Robot Cooperative Walk" , (1997,hereafter Miyake). Miyake discloses a mutual-entrainment-based internal control system (abstract).

Claim 1 : A nonlinear controller (pg. 124, Introduction, right column, 2nd paragraph, lines 2-3) comprising: a first module (the oscillator system in figure 3, pg. 125)composed of a nonlinear system for creating a synchronous state (pg. 125, left column, 3rd paragraph, lines 7-10 discusses the process of stabilization via synchronization of the system) with a controlled object through a nonlinear interaction with the controlled object; and a

second module (see claim interpretation) composed of a feedback system (pg. 125, observation part to the internal model from the oscillator)for adjusting a parameter to vary a relation value (human data values i.e., figures 4-7, discussing the relation with the robotic time/phase values)of the first module (the oscillator system in figure 3, pg. 125)relating to the synchronization (pg. 125, left column, 3rd paragraph, lines 7-10 discusses the process of stabilization via synchronization of the system) with the controlled object based on a difference between the relation value (human data values i.e., figures 4-7, discussing the relation with the robotic time/phase values)and a target relation value (target relation value i.e., figures 4-7, discussing the relation with the robotic time/phase values), wherein the controlled object is controlled by convergence of the relation value (human data values i.e., figures 4-7, discussing the relation with the robotic time/phase values)relating to the synchronization (pg. 125, left column, 3rd paragraph, lines 7-10 discusses the process of stabilization via synchronization of the system) of the first module (the oscillator system in figure 3, pg. 125)to the target relation value (target relation value i.e., figures 4-7, discussing the relation with the robotic time/phase values), and the first module (the oscillator system in figure 3, pg. 125)vibrates at different natural frequencies from the controlled object, and the nonlinear interaction has an entrainment effect (title with figure 3).

Claim 3 (Currently amended): The nonlinear controller as recited in Claim 1, wherein the relation value (human data values i.e., figures 4-7, discussing the relation

with the robotic time/phase values)relating to the synchronization (pg. 125, left column, 3rd paragraph, lines 7-10 discusses the process of stabilization via synchronization of the system) is a phase difference between a vibration of the controlled object and a vibration of the first module, (the oscillator system in figure 3, pg. 125) and a parameter is the natural frequency of the first module(the oscillator system in figure 3, pg. 125).

Claim 4 (Previously presented): The nonlinear controller as recited in claim 1, wherein the synchronous state between the first module (the oscillator system in figure 3, pg. 125)and the controlled object is achieved through transmission and reception of rhythm.

Claim 6 (Previously presented): The nonlinear controller as recited in Claim 3, wherein the synchronous state between the first module (the oscillator system in figure 3, pg. 125)and the controlled object is achieved through transmission and reception of rhythm.

Claim 7 (Previously presented): The nonlinear controller as recited in Claims 1, wherein the synchronous state between the first module (the oscillator system in figure 3, pg. 125)and the controlled object is achieved through a radio wave or network (figure 4, with pg. 126, left column, section 3.1, discloses a type of network of mutual interaction between real robot and a human).

Claim 9 (Previously presented): The nonlinear controller as recited in Claim 3, wherein the synchronous state between the first module (the oscillator system in figure 3, pg. 125)and the controlled object is achieved through a radio wave or network (figure 4,

with pg. 126, left column, section 3.1, discloses a type of network of mutual interaction between real robot and a human).

Claim 10 (Previously presented): The nonlinear controller as recited in Claim 4, wherein the synchronous state between the first module (the oscillator system in figure 3, pg. 125)and the controlled object is achieved through a radio wave or network (figure 4, with pg. 126, left column, section 3.1, discloses a type of network of mutual interaction between real robot and a human).

Claim 12 (Previously presented): The nonlinear controller as recited in Claim 6, wherein the synchronous state between the first module (the oscillator system in figure 3, pg. 125)and the controlled object is achieved through a radio wave or network (figure 4, with pg. 126, left column, section 3.1, discloses a type of network of mutual interaction between real robot and a human).

Claim 13 (Currently amended): A nonlinear control method comprising : creating a synchronous state with a controlled object through a nonlinear interaction with the controlled object; acquiring a state variable relating to a dynamic behavior of the controlled object; adjusting (pg. 125, left column, 3rd paragraph, lines 7-10 discusses the process of stabilization via synchronization of the system; figure 9 shows the result of the time/phase adjustment via entrainment) a parameter for varying a relation value (human data values i.e., figures 4-7, discussing the relation with the robotic time/phase values)relating to the synchronization (pg. 125, left column, 3rd paragraph, lines 7-10 discusses the process of stabilization via synchronization of the system) with the

controlled object based on a difference between the relation value (human data values i.e., figures 4-7, discussing the relation with the robotic time/phase values)relating to the synchronization (pg. 125, left column, 3rd paragraph, lines 7-10 discusses the process of stabilization via synchronization of the system) and a target relation value (target relation value i.e., figures 4-7, discussing the relation with the robotic time/phase values); and creating a new synchronous state with the controlled object using the adjusted parameter(pg. 125, left column, 3rd paragraph, lines 7-10 discusses the process of stabilization via synchronization of the system with the results of the mutual interaction between the robot and the walking of the person, pg. 127, section 3.2, 2nd, paragraph).

Section II: Response to Arguments

102(e)

6. Withdrawn.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure:

- Miyake et al., "Mutual Entrainment Based Human-Robot Communication Field", IEEE 1994, pg.118-123: discloses a mutual entrainment based communication field.

- Muto et al., "Analysis of the Process of Mutual Interaction between Human and Internal Control Model". IEEE 2000, pg. 769-774: discloses an internal model control.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715.

If attempts to reach the examiner by telephone are unsuccessful, please contact examiner's supervisor Mr. Albert Decady (571-272-3819). The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.. Answers to questions regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) (toll-free (866-217-9197)).

/Albert Decady /
Supervisory Patent Examiner
Tech Center 2100

/Thomas H. Stevens/

Examiner, Art Unit 2121